CLAIM AMENDMENTS

1 - 3. (canceled)

4. (currently amended) The system unit according to claim 1~~5~~ ~~, characterized in that~~ wherein the [[first]] upstream expansion vessel [[A]] for the gas mixture obtained by desorption comprising hydrogen and carbon monoxide, has a line going to the heat exchanger [[E]] and a line going to the expansion vessel [[B]] for the methanol containing liquid.

5. (currently amended) The system unit according to claim 1~~5~~, ~~characterized in that the second~~ further comprising a middle expansion vessel [[B]] for the carbon dioxide gas obtained by desorption has a line going to the heat exchanger [[E]] and a line going to the expansion vessel [[C]] for the methanol containing liquid.

6. (currently amended) The system unit according to claim 1~~5~~ ~~, characterized in that~~ wherein the expansion vessel [[C]] for the gaseous carbon dioxide obtained by desorption has a line [[(1)]]going to the heat exchanger [[E]] and a line for the methanol containing liquid to the ~~upstream~~ absorber ~~which for its part is~~ connected by a line [[(2)]] feeding the methanol heated up there to the liquid/gas separator [[D]].

7. (currently amended) The system unit according to claim 15 ~~, characterized in that~~ wherein the liquid/gas separator [[D]] has a branch line ~~(3) for the~~ feeding gaseous carbon dioxide and another line ~~(4) provided for~~ feeding [[the]] separated methanol to the downstream regenerator.

8. (currently amended) [[The]] A process for desorption of carbon dioxide and other gaseous impurities from methanol in the system [[unit]] in accordance with claim 15, wherein the desorption is carried out stepwise in ~~a multiplicity of sequentially arranged~~ the expansion vessels, ~~at least one~~ the heat exchanger and ~~at least one~~ the liquid/gas separator, ~~characterized in that~~ the process comprising the steps of:

feeding the methanol leaving the expansion vessel C at a temperature of -60°C ± 10°C and a pressure of 1 to 2 bar ~~is fed~~ into the heat exchanger E, ~~heated there~~

heating the methanol in the heat exchanger to a temperature of -10 ± 5 °C and [[fed]] thereafter feeding the heated methanol into the liquid/gas separator D, and

flowing substances between the expansion vessels and to the heat exchanger and liquid/gas separator primarily by a thermosiphon effect.

9. (canceled)

10. (currently amended) The process according to claim 8~~, characterized in that~~ wherein in the upstream expansion vessel [[A]] the pressure decreases from about 55 bar to about 9 bar and mainly hydrogen and carbon monoxide are desorbed at a temperature of about -45°C, the method further comprising the steps of ~~wherein the~~

recovering a gas fraction obtained after passing through the heat exchanger ~~E is recovered~~ to the process, [[while]] and

feeding the liquid fraction ~~is fed~~ to a ~~second~~ middle expansion vessel [[B]] between the upstream and downstream vessels.

11. (currently amended) The process according to claim 8~~, characterized in that~~ wherein in ~~the second~~ a middle expansion vessel [[B]] between the upstream and downstream vessels the pressure decreases from about 9 bar to about 2.7 bar and a liquid fraction is obtained along with gaseous carbon dioxide ~~is obtained~~ at a temperature of about -45°C, to about -52°C, ~~which is fed~~ the process further comprising the step of

feeding the gaseous carbon dioxide through the heat exchanger E and thence out of the system ~~subsequently obtained for the process, while~~ feeding the liquid fraction ~~obtained is fed~~ to the [[third]] downstream expansion vessel [[C]].

12. (currently amended) The process according to claim 8~~, characterized in that~~ wherein, in the [[third]] downstream expansion vessel ~~C, the~~ pressure decreases from [[of]] about 2.7 bar ~~decreases~~ to about 1.2 bar and gaseous carbon dioxide is obtained at a temperature of about -52°C, to about -60°C, ~~which is fed~~ the process further comprising the step of

feeding the gaseous carbon dioxide through the heat exchanger and thence out of the system ~~E and subsequently can be obtained for the process~~.

13. (currently amended) The process according to claim 8, ~~characterized in that a~~ further comprising the steps of

dividing a liquid fraction ~~contained~~ in the [[third]] downstream expansion vessel C ~~is divided~~ into two streams, ~~wherein~~

feeding one of the streams ~~is fed~~ to the ~~upstream~~ absorber [[(5)]] and

passing the ~~second~~ other stream ~~after passing~~ through the heat exchanger [[E]] via the output line ~~(2) is fed~~ and feeding it to the liquid/gas absorber [[D]].

14. (currently amended) The process according to claim 8, ~~characterized in that the~~ further comprising the steps of:

recovering a liquid fraction ~~(4) recovered~~ in the liquid/gas separator, ~~D is fed~~

feeding the recovered liquid fraction to ~~a downstream~~ the regenerator [[(6)]] for removal of the last traces of carbon dioxide, and

purifying a [[the]] gas fraction ~~(3) preferably purified~~ with further carbon dioxide rich gas fractions is obtained to the process.

15. (new) A system comprising:

an absorber in which high-pressure methanol is contacted with synthesis gas to transfer impurities including carbon dioxide from the gas to the methanol;

a heat exchanger having a top side and a bottom side;

a plurality of series-connected expansion vessels including an upstream expansion vessel and a downstream expansion vessel;

means for feeding impurity-laden methanol from the absorber through the heat exchanger and into the downstream expansion vessel for forming in the downstream expansion vessel a body of methanol having a liquid level;

a liquid/gas separator;

an inlet line feeding methanol from the downstream expansion vessel through the bottom side into the heat exchanger, the inlet line having a portion about 0.5 m below the bottom side, whereby carbon dioxide is desorbed from the methanol in the separator;

an output line extending from the top side of the heat exchanger to the liquid/gas separator to form therein a body of methanol having a liquid level, the liquid/gas separator and downstream expansion vessel being relatively oriented such that the liquid level in the downstream expansion vessel is between 1 m and 20 m above the liquid level in the liquid/gas separator, the liquid/gas separator and the heat exchanger being relatively oriented such that the liquid level in the liquid/gas separator is about 0.5 m above the top side of the heat exchanger; and

a regenerator receiving methanol from the liquid-gas separator.